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| APPLICATION NO.                           | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/054,633                                | 01/22/2002  | Niall R. Lynam       | DON01 P-962         | 5792             |
| 28101                                     | 7590        | 12/28/2004           | EXAMINER            |                  |
| VAN DYKE, GARDNER, LINN AND BURKHART, LLP |             |                      | NEGRON, ISMAEL      |                  |
| 2851 CHARLEVOIX DRIVE, S.E.               |             |                      |                     |                  |
| P.O. BOX 888695                           |             |                      | ART UNIT            |                  |
| GRAND RAPIDS, MI 49588-8695               |             |                      | 2875                |                  |

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/054,633

Applicant(s)

LYNAM ET AL.

Examiner

Ismael Negron

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 130-184,251 and 252 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 130-184,251 and 252 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on December 8, 2004 has been entered. Claims 130, 134-136, 140, 142, 159, 160, 163-165, 172 and 176-178 have been amended. Claims 1-129 and 185-250 have been cancelled. Claims 251 and 252 have been added. Claims 130-184, 251 and 252 are still pending in this application, with claim 130 being independent.

### *Title*

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **Vehicle Interior LED Lighting System.**

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 130-138, 140-143, 146-149, 152-159, 163-179, 183 and 184 are rejected under 35 U.S.C. 102(b) as anticipated by BOS et al. (U.S. Pat. 5,671,996) or, in the

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alternative, under 35 U.S.C. 103(a) as obvious over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668).

BOS et al. discloses a vehicle illumination system having:

- **an accessory module assembly (as recited in Claim 130), Figure 1, reference number 10;**
- **the module assembly being adapted for attachment to an interior portion of a vehicle (as recited in Claim 130), column 1, lines 57-66;**
- **the module assembly being configured to illuminate an area inside the vehicle (as recited in Claim 130), column 4, lines 55-60;**
- **the module assembly being attached to an interior portion of the vehicle (as recited in Claim 130), column 1, lines 57-66;**
- **the module assembly including a single non-incandescent light source (as recited in claims 130 and 166), Figure 4, reference number 90;**
- **the single light source being a single high-intensity power light emitting diode (HiLED) (as recited in Claim 130), column 6, lines 65 and 66;**

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- **the HiLED illuminating the area with an efficiency of at least 1 lumen/watt (as recited in Claim 130), column 7, lines 1-8;**
- **the HiLED being operated at a current of at least 100 mA (as recited in Claim 130), column 7, lines 40-43;**
- **the voltage conversion element converting a battery/ignition voltage of the vehicle to the forward operating voltage of the HiLED (as recited in Claim 130), column 8, lines 14-26;**
- **the illuminated area being at a distance greater than 20 inches from the module assembly (as recited in Claim 131), as seen in Figure 2;**
- **the illuminated area being at a distance greater than 40 inches from the module assembly (as recited in Claim 132), as seen Figure 2;**
- **the illuminated area being at a distance of about 20 to 40 inches from the module assembly (as recited in Claim 133), Figure 4, reference number 2;**
- **a voltage conversion element (as recited in claim 134, 163 and 164), column 8, lines 14-26;**

- **the voltage conversion element having a step-down  
ration of at least about 2 to 1 (as recited in Claim 134),  
column 8, lines 14-26;**
- **the voltage conversion element having a step-down  
ration of at least about 4 to 1 (as recited in Claim 135),  
column 8, lines 14-26;**
- **the voltage conversion element having a step-down  
ration of at least about 6 to 1 (as recited in Claim 136),  
column 8, lines 14-26;**
- **the HiLED emitting at least 1 lumen (as recited in Claim  
137), column 7, lines 40-43;**
- **the HiLED emitting at least 5 lumen (as recited in Claim  
138), column 7, lines 40-43;**
- **the module assembly including a light directing element  
(as recited in Claim 141), Figure 6, reference number 100;**
- **the light directing element directing light from the HiLED  
towards the interior area of the vehicle (as recited in  
Claim 141), column 8, lines 36-45;**
- **the HiLED operating at a voltage of at least about 1 volt  
(as recited in Claim 152), column 7, lines 16-18;**
- **the HiLED operating at a voltage of at least about 2 volts  
(as recited in Claim 153), column 7, lines 16-18;**

- the HiLED operating at a voltage of at least about 2 to 5 volts (as recited in Claim 154), column 7, lines 16-18;
- the HiLED operating at a voltage of less than about 50% of the battery/ignition voltage of the vehicle (as recited in Claim 155), column 8, lines 14-22;
- the HiLED operating at a voltage of less than about 35% of the battery/ignition voltage of the vehicle (as recited in Claim 156), column 8, lines 14-22;
- the HiLED operating at a voltage of less than about 20% of the battery/ignition voltage of the vehicle (as recited in Claim 157), column 8, lines 14-22;
- the battery/ignition voltage being about 12 volts (as recited in Claim 158), column 8, lines 20-22;
- the battery/ignition voltage being in the range of about 12 volts to 42 volts (as recited in Claim 159), column 8, lines 20-22;
- a power resistor (as recited in claims 163, 177 and 252), Figure 4, reference number 92;
- the HiLED assembly being removable (as recited in Claim 167), as seen in Figure 4;
- the accessory module including a mirror assembly (as recited in Claim 168), as seen in Figure 2;

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- **the light directing element being a lens (as recited in Claim 169), column 8, lines 36-38;**
- **light from the HiLED assembly passing through the lens (as recited in Claim 169), inherent;**
- **the lens being one selected from the group consisting of a diffractive and refractive optical element (as recited in Claim 170), column 8, lines 38-40;**
- **the lens being one selected from the group consisting of a Fresnel-optic lens, a binary optic lens, a diffusive-optic lens, a holographic-optic lens and a sinusoidal-optic lens (as recited in Claim 171), column 8, lines 38-40;**
- **the module assembly including the voltage conversion element (as recited in Claim 178), as seen in Figure 4;**
- **the interior portion including a header assembly (as recited in Claim 183), as seen in Figures 12 and 13; and**
- **the accessory module including an interior rearview mirror assembly (as recited in Claim 184), as seen in Figure 2.**

BOS et al. disclose all the limitations of the claims, except :

- **a heat dissipation element (as recited in claims 251, 146, 147, 165, 175 and 176);**



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- the heat dissipation element being adapted to dissipate heat from the HiLED (as recited in Claim 251);
- the heat dissipation element including a reflective surface for reflecting light from the HiLED (as recited in claims 140, 142, 146, 172 and 179);
- the reflective surface reflecting light toward the illuminated area (as recited in claims 140, 172 and 179);
- the heat dissipation element being a heat-sink (as recited in claims 140, 147, 172 and 179);
- the heat sink being a metal heat sink (as recited in claims 143, 172 and 173);
- the HiLED being thermally coupled to the heat sink (as recited in Claim 148);
- the HiLED being thermally coupled to the heat sink by a heat sink compound (as recited in Claim 149);
- the metal of the heat sink having a high heat conductivity (as recited in Claim 173);
- the metal heat sink being made from a metal selected from the group consisting of a copper, copper alloy, aluminum and brass (as recited in Claim 174).

COLLINS et al. discloses light emitting diode having:

- **a heat dissipation element (as recited in claims 251, 146, 147, 175 and 176), Figure 4, reference number 12;**
- **the heat dissipation element being adapted to dissipate heat from the HiLED (as recited in Claim 251), inherent;**
- **the heat dissipation element including a reflective surface for reflecting light from the HiLED (as recited in claims 140, 142, 146, 172 and 179), Figure 4, reference number 14;**
- **the reflective surface reflecting light toward the illuminated area (as recited in claims 140, 172 and 179), column 2, lines 44-47;**
- **the heat dissipation element being a heat-sink (as recited in claims 140, 147, 172 and 179), as seen in Figure 3;**
- **the heat sink being a metal heat sink (as recited in claims 143, 172 and 173), column 2, line 8;**
- **the HiLED being thermally coupled to the heat sink (as recited in Claim 148), column 2, lines 14-16;**
- **the metal of the heat sink having a high heat conductivity (as recited in Claim 173), inherent;**
- **the heat sink having fins, Figure 4, reference number 17 and 18;**

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- **a reflector**, Figure 4, reference number 14;
- **the reflector including a heat sink**, as seen in Figure 3;
- **the reflector being configured to shape light emitted from the HiLED**, column 2, lines 44-47.

One of ordinary skill in the art at the time the invention was made would have recognized that the HiLED of BOS et al. included the claimed metal heat-sink/reflector, specifically an aluminum heat-sink/reflector as such structures are a standard feature of most LED (as recited in claims 140, 142, 143, 146-149, 165, 172-176, 179 and 251). However, even if one of failed to recognized such fact, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the integrated metal heat-sink/reflector of COLLINS et al. in the HiLED of BOS et al. to increase the efficiency and light output of such HiLED, as per the teachings of COLLINS et al. (see column 2, lines 64-67).

Regarding the heat sink being specifically made from a metal selected from the group consisting of a copper, copper alloy, aluminum and brass (as recited in Claim 174)., the examiner takes Official Notice that the use of such materials is not only old and well known in the art, but a standardized practice. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a metal selected from the group consisting of a copper, copper alloy, aluminum and brass as the material of the heat sink. One would have been motivated since such materials are recognized in the art to have many desirable advantages, including low cost, high malleability, and high thermal conductivity, over other materials.

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4. Claims 139, 144, 145, 149-151, 160-162 and 180-182 are rejected under 35 U.S.C. 103(a) as being unpatentable over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668).

The teachings of BOS et al. and COLLINS et al. disclose individually, or suggest in combination, all the feature of the claimed invention including a heat sink having a plurality of fins (as recited in Claim 145, see COLLINGS et al. Figure 4, reference numbers 17 and 18), except:

- the HiLED emitting at least about 10 lumens (as recited in Claim 139).;
- a heat sink having an area of at least about 1 square inch (as recited in Claim 144;
- the HiLED operating at a current greater than about 250 mA (as recited in Claim 150);
- the HiLED operating at a current greater than about 350 mA (as recited in Claim 151);
- the resistor being rated to dissipated at least about 2.5 watts (as recited in Claim 160);
- the resistor being rated to dissipated at least about 3.0 watts (as recited in Claim 161);
- the resistor being rated to dissipated at least about 3.5 watts (as recited in Claim 162);

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- the HiLED dissipating at least about 1 watt when operated (as recited in Claim 180);
- the HiLED dissipating at least about 1.5 watts when operated (as recited in Claim 181); and
- the HiLED dissipating at least about 2 watts when operated (as recited in Claim 182).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use HiLED, heat sink and resistors having the specific properties claimed by the instant invention (as recited in claims 139, 144, 145, 149-151, 160-162 and 180-182), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. In this case BOS et al. discloses using a HiLED for illuminating the interior of a vehicle, selecting a specific HiLED, heat sink and its appropriate power resistor have been an obvious matter of choice depending on the particular requirements of a specific application.

5. Claim 159 is rejected under 35 U.S.C. 103(a) as being unpatentable over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668).

The teachings of BOS et al. and COLLINS et al. disclose individually, or suggest in combination, all the feature of the claimed invention, except the vehicle's battery/ignition voltage being about 42 volts.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to design the voltage conversion element to work with a vehicle's battery/ignition voltage of 42 volts, since such 42 volts voltage is the new proposed standard for vehicles electric systems.

### ***Response to Arguments***

6. Applicant's arguments filed December 8, 2004 have been fully considered but they are not persuasive.

7. Regarding the Examiner's rejection of Claim 130 under 35 U.S.C. 102(b) as anticipated by BOS et al. (U.S. Pat. 5,671,996) or, in the alternative, under 35 U.S.C. 103(a) as obvious over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668), the applicant argues that the cited reference, or combination of references fail to disclose all the features of the claimed invention, specifically the accessory module assembly having a single LED for illuminating an interior of a vehicle with a luminous intensity of 1 lumen per watt when the LED is operated at a forward current of at least 100 milliamps and a voltage of about 5 volts, in combination with a voltage conversion element for converting the battery ignition voltage of the vehicle to the operating voltage of the LED.

In response to the arguments, the applicant is respectfully advised that it has been held by the courts that where the general conditions of a claim are disclosed in the

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prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. In this case, as detailed in sections 3 and 4 of the instant Office Action, BOS et al. discloses a vehicle accessory module 10 attached to an interior portion of the vehicle (as seen in Figure 4), such accessory module including an LED 90 for illuminating an interior area of the vehicle (as seen in Figure 2). The LED is powered by a voltage conversion element (seen in Figures 8 and 9), which converts the vehicle voltage to the operational voltage of the LED (column 8, lines 18-26), such voltage being about 5 volts (see column 8, lines 22-24). The LED is also disclosed as operating at a current of about 200 milliamps (see column 7, lines 40-43). While BOS et al. is silent as to the LED operating specifically at a luminous efficiency of at least about 1 lumen per watt, such limitation was considered an obvious matter of selecting the appropriate Led for a given application. One would have been motivated to achieve a desired illumination effect/pattern.

8. Regarding the Examiner's rejection of claim 176 and 251 (subject matter previously featured by Claim 130) under 35 U.S.C. 102(b) as anticipated by BOS et al. (U.S. Pat. 5,671,996) or, in the alternative, under 35 U.S.C. 103(a) as obvious over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668), the applicant argues that the cited reference, or combination of references fail to disclose all the features of the claimed invention, specifically a heat dissipation element adapted to dissipate heat from the LED.

In response to applicant's surprising arguments, the Examiner respectfully directs the applicant to Figure 3 of COLLINS et al. where an LED chip 11 is shown having a

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heat dissipation element 12, such element being adapted to dissipate heat from the LED chip 11 (as evidenced by Figure 4). In addition, it is noted that the advantages of providing LED with heat dissipation elements are recognized in the art, as it is old and well known that the efficiency of LED light source diminishes very rapidly as the LED chip exceeds the maximum operating temperature.

9. Regarding the Examiner's rejection of Claim 140 under 35 U.S.C. 102(b) as anticipated by BOS et al. (U.S. Pat. 5,671,996) or, in the alternative, under 35 U.S.C. 103(a) as obvious over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668), the applicant argues that the cited reference, or combination of references fail to disclose all the features of the claimed invention, specifically a reflective surface for reflecting light from the LED.

In response to applicant's arguments, the Examiner, once again, respectfully directs the applicant to Figure 3 of COLLINS et al. where the LED chip 11 is shown located inside a depression 16 including tapered walls 14. The walls 14 are polished to reflect upwardly the light produced by the LED chip 11 (column 2, lines 44-49). In addition, it is noted that the term "reflecting surface" could be broadly interpreted to include almost any surface other than a black body. The interior surface of the cylindrical adapter 94 of BOS et al. (see Figure 6) would also meet the "reflective surface" limitation (see column 8, lines 65-67).

10. Regarding the Examiner's rejection of Claim 141 under 35 U.S.C. 102(b) as anticipated by BOS et al. (U.S. Pat. 5,671,996) or, in the alternative, under 35



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U.S.C. 103(a) as obvious over BOS et al. (U.S. Pat. 5,671,996) in view of COLLINS et al. (U.S. Pat. 3,676,668), the applicant argues that the cited reference, or combination of references fail to disclose all the features of the claimed invention, specifically a light directing element for directing light emitted by the LED towards the interior area of the vehicle.

Figure 3 of COLLINS et al. shows an LED chip 11 surrounded by polished tapered walls 14, such walls being used to redirect upwardly the light emitted by the LED chip 11. In addition, cylindrical adapter 94 of BOS et al. (see Figure 6) is also used to redirect the output of LED 90.

11. Regarding the Examiner's rejection of claims 131-139, 142-175, 177-184 and 252, the applicant present no arguments, except stating that such claims depend directly or indirectly from independent claim 130, or dependent claims 140, 141, 176 or 251, and would be allowable when/if claims 130, 140, 141, 176 or 251 (as applicable) are allowed.

***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

13. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ismael Negrón whose telephone number is (571) 272-2376. The examiner can normally be reached on Monday-Friday from 9:00 A.M. to 6:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra L. O'Shea, can be reached at (571) 272-2378. The facsimile machine number for the Art Group is (703) 872-9306.


15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, go to <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) toll-free at 866-217-9197.

  
Inr

December 23, 2004

  
Stephen Husar  
Primary Examiner